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ACUTE INFLAMMATORY AFFECTIONS OF THE MAMMÆ, WITH SPECIAL REFERENCE TO TREATMENT DURING LACTATION.*

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In presenting a paper under this title I realize I have chosen no new subject, but from the diversity of opinion as to the aetiology and treatment of mastitis expressed in the text-books on surgery, and the comparatively little to be found in even the most recent works on obstetrics and gynæcology, I am warranted, I trust, in my selection. That the frequency of mastitis during the puerperal period has been much lessened, both in private and hospital practice, must be attributed to the general and special means employed for prophylaxis against septic infection; yet even with such means the number of cases which one connected with any large dispensary continues to see is considerable. The importance of proper treatment of mastitis is not to

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be considered as alone due to this lesion, for, as stated by Winckel, strong evidence now exists that a large percentage of the primary carcinomata of the breast are the result of mastitis. When we consider the histology of the mammae we find we have to deal with exceptionally complex tissues, which, in the performance of their function and close relation to other organs, pass through active changes and are prone to inflammatory lesions. Of the three essential histological elements—the glandular, fibrous, and adipose—the glandular tissue forms a compound racemose gland, but is distinguished from other such glands in not having a single excretory duct, but eighteen to twenty canals, each one of which belongs to the primary lobes, or, indeed, separate glands, the excretory ducts of which open on the nipple, and at the base of which are numerous sebaceous and sweat glands and hair follicles. The fibrous tissue connects the lobes and forms the suspensory ligaments and contains the vessels and lymphatics; the adipose tissue envelops the lobules and lobes. Each of these elements may be the seat of inflammatory action, and, by reason of their anatomical arrangement, afford specially favorable avenues for the entrance of pyogenic organisms. While four out of every five cases of acute inflammatory affections of the breast occur during lactation, we find that next in frequency are those during infancy and at puberty. In infancy, generally shortly after birth, and more often in males than females; at puberty in females, when structural changes in the glandular tissue accompany the establishment of menstruation, and rarely also at puberty in boys, are minor grades of inflammation seen, which in some cases result in suppuration. Besides these periods, when inflammations are more liable to occur in the parenchyma of the breast, we may at any time have diseases of the skin of the areola and of the nipple, which predispose to inflammations of the gland when any

exciting cause presents. Of the malformations which may occur, that most frequently observed is a too flat or retracted surface of the nipple, associated with shortness of the excretory milk ducts. This malformation may be due to a congenital shortness of the milk ducts or from an early inflammatory process which has shortened and drawn the nipple inward, but undoubtedly the usual cause of too flat nipples is pressure. Statistics state the right breast to be the one most frequently affected by inflammation, and of the twenty-two cases of mastitis seen during the past year, my records confirm this, since of the first eight consecutive cases all were of the right breast, and of the remaining fourteen, seven were also of that side. It is difficult to assign any positive explanation for this, unless it be that in nursing the mother supports the child in such a way that less traction is made on the left nipple, and hence the muscular fibers of the cutis are subjected to less irritation and abrasions are not as likely to occur. The lesions of the nipple we describe as of three varieties: erosions, fissures of the apex, and fissures of the base. An erosion of the nipple is due to denuding of the epithelium from the constant flow of milk over its surface, and the maceration due to too long and frequent suckling, together with the irritation from the lips and tongue of the child. This is common during the first weeks of lactation, especially when the flow of milk is delayed and repeated efforts are made to nurse the child without success. The excoriation of the nipple is situated generally at the summit, but may be so large as to cover the whole nipple and give it the appearance of a strawberry. The fissures of the apex are simply an extension of the normal division between the papillæ, and the causes are the same as those which produce erosions. The fissures at the base are generally beneath the nipple and are most frequently seen in women whose nipples are long and bent down on

the areola from the pressure of the corsets. From heat and moisture the skin becomes macerated. The importance of prophylaxis against these forms of sore nipples can not be overestimated, since the vast majority of all cases of mastitis can be assigned to lesions of the nipple, which afford an avenue of entrance for pyogenic organisms. The means employed for prophylaxis are the wearing of such clothing as will not cause from pressure the depression of the nipples. When this has occurred and when pregnancy exists, efforts should be made to draw out the nipple, at the same time employing some astringent lotion; cologne or alcohol suffices during the early months, but during the last month of pregnancy an alum solution is to be recommended. A further and most important agent of prophylaxis is absolute cleanliness in nursing, both for mother and child. In some of the foreign maternity hospitals a solution of bichloride is applied after nursing and the nipple carefully cleansed before the child is again put to the breast, the child's mouth being cleansed with a solution of borax or boric acid. Should the nipple be excoriated, measures should be immediately taken to protect it from maceration and friction by temporary suspension of nursing, or in some cases the use of a suitable nipple shield, together with the application of nitrate of silver or compound tincture of benzoin. My preference is to discontinue nursing for a time, and if the breast becomes engorged with milk, apply pressure and the use of a solution of nitrate of silver about the nipple. For fissures of the summit, the nipple shield with cauterization of the fissures with the stick of nitrate of silver. For fissures at the base the above means can be used, but it is of decided benefit to combine them with the use of a dry dressing with aristol or like powder about the nipple to prevent its coming in contact with the skin. Of the varieties of mastitis, that which occurs soon after birth—*mastitis neonatorum*—

is deserving of attention, since its results as indicated above may have a marked effect on the formation of the nipple, causing it to be umbilicated. The parenchyma of the gland is here affected and the breasts appear swollen and tender, containing occasionally a milky substance ; if no attempt is made, as is often the case by an overzealous nurse, to express the milk or massage the gland, the swelling will soon disappear spontaneously. If mechanical irritation has occurred, a mastitis or even an abscess is liable to result. If the breast shows evident signs of inflammation, then apply under pressure a dressing of acetate of aluminum consisting of alum, liquor plumbi subacetatis, and water, in the proportion of five, twenty-five, and five hundred, respectively, in hopes to abort any abscess; and if this fails and an abscess forms it must be incised, care being taken to make the incision away from the nipple. Mastitis occurring at puberty and in non-puerperal women is usually the result of some injury and is circumglandular. The indications for treatment here are the same as those just described. Endeavor to abort inflammation ; failing in this, incise under antiseptic precautions. That each form and degree of mastitis should be differentiated is of much clinical importance, since the treatment indicated depends upon what parts of the gland are involved and how far the inflammatory process has advanced. Mastitis may occur as simple dilatation of a single milk duct from inspissated milk, giving a gross appearance of a hard and sensitive lump in any part of the parenchyma of the gland ; from this, the most simple form, all grades of severity are observed, till the whole gland is occupied by a multilocular abscess, the contents of which are pus, inspissated milk, and broken-down connective tissue. The three main varieties are generally described according to the site of inflammation, when this has progressed to the formation of abscess.

- 1. The supramammary abscess in the subcutaneous tissues about the gland.
- 2. When the parenchyma of the gland is affected. In the early stages this may involve either the glandular or interstitial connective tissues, but at the latter stages both these tissues are included as a nidus for pyogenic forces.

3. Submammary abscess, lying beneath the gland in the connective tissues attaching the breast to the pectoral muscle. In all these deeply-situated abscesses some direct communication exists with an acinus of the gland where the germs have established a septic process, which later involves the connective tissues. Besides the above-mentioned varieties of mastitis, mention should be made of lacteal engorgement, due to the complete or partial occlusion of one or more lactiferous ducts, with the result of inspissation of the milk. Although repeated experiments have been made to find special bacteria which could cause fermentation or curdling of the milk in a gland secreting normal milk, none have as yet been definitely discovered. Lacteal engorgement may occur in breasts where no external evidence of septic infection can be discovered, and in cases where the whole puerperal period has been marked by no symptom indicative of sepsis following labor. Reynolds states that the inspissation of milk might occur as the result of a local congestion of the secreting epithelium, caused by traumatism or even an exposure of the breast to a draught of cold air. Certainly, the distinction between simple lacteal engorgement and the forms of septic mastitis can be made by clinical symptoms, and should have a potent influence in distinguishing between the modes of treatment employed in the early stages. The ætiological factors of true mastitis are various, but the presence of one or more species of pyogenic organisms is essential. Cheyne holds that when the abscess is in the parenchyma of the gland the staphylococci are to

be found, which begin the inflammatory process in the deeper part of the organ and spread toward the surface, and that their entrance into the gland is along the milk ducts; while in case of suppuration, which occurs in connection with the streptococci, the disease begins with a rapidly spreading redness of the skin, extending from some crack or fissure of the nipple, and the suppuration in the deeper parts follows this superficial affection, these organisms spreading along the lymphatics. Further means by which these organisms may establish suppuration are by superficial inoculation and by inunction from rubbing in oils, entrance being afforded by the ducts of sweat glands, orifices of sebaceous glands, hair follicles, and portions of the skin where the protecting epidermis has been scratched or destroyed. These organisms have been frequently found in the blood of patients suffering from septic fever, and in that form of sepsis designated as puerperal fever they are known to have been excreted in the milk when an entire absence of disease or ulceration of the nipple existed; hence they must have come from the uterine wound. Certain factors have long been recognized as predisposing to the action of the causes of inflammation, and among them cold is to be mentioned, because it makes a weak tissue, and therefore liable to an attack from organisms. Traumatism may also act as a predisposing cause by setting up the early stages of inflammation, dilatation of the vessels and congestion, and by leading to an effusion of the blood, thus allowing the cocci in the blood to escape into the tissues. Pyogenic cocci may exist outside of the body, having been cultivated from water which came in contact with decomposing beef and used in the kitchen for rinsing dishes; but the most frequent habitat outside the body is in the skin, especially where the surface is moist—as in the axilla, between the nates, and in the secretion from the pharynx and nasal mucus. This will

suffice to illustrate some of the means which supply the causes of inflammation, and the avenues by which ready access is afforded to the tissues of the breast. As to the symptoms which each of the varieties of mastitis presents, too much stress can not be put upon them, as a full comprehension of them is essential for differential diagnosis and special treatment. Lacteal engorgement usually presents in the early stages as a circumscribed swelling, situated in one of the lobes apart from the nipple and areola, and entire absence of inflammatory changes of the skin and subcutaneous tissue, such as heat and redness. This localized lump is hard, and not especially painful. By reason of the tension and direct pressure produced from the occlusion of a single duct or acinus with inspissated milk, other lactiferous ducts become obliterated and a stasis occurs which may continue to encroach upon the successive portions of the lobe, or even each of the several lobes forming the entire gland, when a condition results commonly known as caked breast. This retention and engorgement of the mammary gland is frequently observed in all mammalia when, for any reason, the milk fails to be excreted. An instructive lesson as to treatment can be found in observing that lower in the grade of brute mammalia, where no efforts are made by man to apply means for alleviating this trouble, mastitis rarely follows. Hence we conclude that rest and non-interference are indicated in the treatment of this affection, and would strongly protest against the active massage and the use of the breast pump, so generally employed. When attempts are made to relieve this condition that the patient may be freed from the pain and discomfort caused by overdistention, then recourse must be had to the application of uniform and continuous pressure. This is obtained by one of the forms of breast binders, of which there have been many invented; that employed

by the writer is known as the New York Maternity breast bandage. Its simplicity and easy application commend it, and certainly the results have been most satisfactory, as evinced by its use in the Sloane Maternity Hospital, where, in two thousand puerperal women, but a single case of caked breast has resulted in abscess, and this was undoubtedly septic when the patient was admitted, erosion of the nipple existing. Squire has suggested the dilatation of the lactiferous tube on the nipple, finding this by means of a magnifying glass, then evacuating the milk in the over-distended reservoir of the corresponding milk duct—a measure good in theory, but adding one more factor for direct septic infection. The results of the breast binder are not always to be seen in the first twenty-four or forty-eight hours, as indicated by the decrease in the size of the breast; but when no evidence of sepsis is seen by inflammatory changes in the skin and the hard localized lump gives no appearance of change into an abscess, the pressure should be continued for several days, when drainage of the milk will have become established; and if the general condition of the patient is good, and this caking of the breast is during the early weeks of lactation, rest can be given a breast for a number of days without permanently stopping its return to functional activity. The symptoms of inflammation in the subcutaneous tissues about the mammae, and especially those in or adjacent to the areola, are those associated with phlegmons in other situations affecting like tissues. They are seldom large, soon affecting the skin above, and rapidly passing into the formation of a localized abscess without giving rise to any marked constitutional symptoms. If seen very early, attempts should be made to abort or limit the inflammation by rendering the external parts aseptic, and application of cold or a wet antiseptic dressing. Should these fail and the formation of an abscess with fluc-

tuation be accomplished, immediate incision should be made in such a manner as not to affect the nipple or pass through the connective tissue overlying the gland. The cavity should be thoroughly irrigated, best with bichloride solution, and the nursing stopped by the application of a dry sterilized dressing, put on under pressure, care being taken to protect with abundant padding the other breast, but leaving its nipple free. Here the usual three-inch roller bandage can be used to fulfill all indications. The inflammation of the glandular structure causing parenchymatous mastitis, the variety most frequently observed, occurs generally at the beginning or end of lactation. In this form we have marked constitutional symptoms of a distinctive septic character; an early chill followed by rise of temperature, with rapid pulse and abundant perspiration. The pain is often intense and the lymphatics connecting with the axillary glands soon show the evidence of inflammation and render the movement of the arm painful. The general contour of the gland is not, in the early stages, much changed, nor is it at any time of the disease when the septic process is limited to a single lobule. But more frequently several foci of inflammation exist, and though the process may have begun in a single duct or acinus, others soon follow and attacks are made upon both the interstitial and glandular tissues, constricting the lactiferous ducts; and large abscess cavities form from union with small pus collections. The walls of a mammary abscess are uneven with sinuous and rough excavations. The secretion of the milk is arrested in one after another of the affected lobules. When such a course has occurred the contour of the gland is changed, and is often considerably distorted by having a hard mass—the result of milk stasis—on one side, and a full, rounded, fluctuating tumor in the area where the abscess has formed. The nipple is frequently depressed by

the traction on the muscular fibers of the milk duets, and the skin presents various changes of color, from a glistening white, with distended blue veins, to a dusky brown. The effect on the general system from a mastitis is often most marked, and the patient passes rapidly into a cachectic condition, when the abscess has been allowed to open spontaneously or aided by the frequent custom of poultices, which predispose to milk fistula, long-continued suppuration, and deformity of the breast from the cicatricial contractions, in which carcinomatous disease may find a beginning. Prophylaxis, as before indicated, by care and surgical cleanliness of the nipple, can, with but few exceptions, prevent this unfortunate disease. When the entrance of pyogenic organisms has occurred, attention should be directed to limiting an increase in their number and restricting their action in affording a favorable nidus. By the complete discontinuance of nursing much can be accomplished in preventing further sources of infection from the child's mouth, or from any disease of the nipple, and by keeping the gland in a state of rest from functional activity, whether it be the affected gland or the sound one, for the latter, if used, has a marked tendency to continue the stimulus and conditions necessary for milk secretion. Efforts must always be made to abort any incipient inflammation, but these can not be successful in the vast majority of cases of mastitis if the usual means of poultices, ointments, liniments, and active massage are employed. All those who believe that inflammations are the result of organisms of a septic nature must base their therapeutic efforts upon strict antiseptic principles. Therefore, in our efforts to abort inflammation, let us render the field as aseptic as possible, and next employ those agents which experience has shown to be effective in limiting the course of septic infections. The affected breast should be scrubbed with soap and water, and special

attention directed toward cleansing the nipple and areola; oil of turpentine is then used over the whole surface, this followed in like way by ether, and finally the gland is washed with corrosive-sublimate solution. In 1857 Foster employed sponges to give uniform and equal pressure to act as an emollient in softening the tissues; in the treatment of incipient mastitis, and after abscesses had formed and been incised, to aid in the absorption of discharge and bring the walls of the sinuses together. The use of large sponges, now thoroughly disinfected and sterilized, is still worthy of employment, and I know of no more effective agent in giving uniformity of pressure and affording an antiseptic dressing. A sponge large enough to cover the breast should be selected; this, being made aseptic, is applied, and, should it be desired, can be wet in an antiseptic solution; over this a quantity of sterilized gauze or absorbent cotton is added, the opposite breast and both axillæ being protected with like material. The breast bandage is now tightly pinned and allowed to remain in place twelve hours, when the dressings are removed and the breast examined to note whether the warfare waged by the micro-organisms has been checked. If signs of inflammation have diminished, the dressings are again applied and left for twenty-four hours. In five cases of incipient mastitis so treated by the writer, four resolved within a week, and the infants again resumed nursing without further breast symptoms developing. In these cases a saline cathartic, given early, affords comfort in diminishing the temperature and lessens the hyperæmia of the breast.

There is but one method of treatment for purulent mastitis—viz., incision, with the employment of every antiseptic precaution.

The field of operation should be rendered aseptic in the manner described above.

Never attempt to incise an abscess of the breast without full surgical anaesthesia, as the pain must be intense if thorough explorations and opening up of the sinuous and uneven cavity is made. The primary incision should be made radially, to avoid, as far as possible, division of the lacteal ducts, and over the site where fluctuation is most marked.

The cavity of the abscess having been entered, insert the index finger to explore with greatest care the cavity to discover each recess; those leading toward the skin and the dependent parts of the breast should be given direct outlet, by incision of the superficial tissues over a dressing forceps introduced into the cavity and along the course of the sinus. Drainage-tubes of stout rubber should be passed into the cavity of the abscess, through the primary and counter incisions. Thorough irrigation with a hot mercuric solution should first be made; this will generally check all oozing and remove quantities of pus and necrotic tissue.

It is advised that the breast should now be firmly compressed to see whether all recesses have been completely emptied of pus. Should additional pus appear, this is evidence that some recess has been overlooked and further exploration is demanded. The irrigation with hot bichloride solution is now followed by the copious injection through each drainage-tube of a strong solution of peroxide of hydrogen. A sterilized sponge is then placed over the affected breast; sufficient antiseptic gauze is added to pad the axilla and protect the opposite gland; these are held in place by a breast bandage firmly applied. This dressing is renewed at the end of twelve hours, and if the discharge has drained into the sponge, as is most likely, because of the free exit afforded, the pressure from the bandage, and the capillary attraction of the sponge, the drainage-tubes, excepting that placed in the most dependent opening, are

no longer of service. Irrigation with peroxide of hydrogen is again employed, the sponges thoroughly disinfected in bichloride solution, or, better, a new sterilized one selected, and the bandage applied as before.

Absence of pain and temperature and the dressing continuing free from discharge permit its remaining unchanged for three or four days. By this time, unless there are shreds of necrosed tissue, which the peroxide of hydrogen has done much toward removing, the last drainage-tube is taken out and no further irrigation used; only the sponge and bandage reapplied, not to be removed for a week. The same treatment is indicated in retromammary abscess, except that, as it usually points near the lower margin of the gland, the incision should be made at that site. If this treatment is employed in cases of mammary abscess, the long-continued suppurating sinuses, with fistulae, chronic interstitial mastitis, and marked deformity of the gland from extensive cicatrices, a starting-point of primary carcinoma, can be almost entirely eliminated from the sequelæ of this frequent disease.

